# THE IMMATURE STAGES OF *PSYLLA ACACIAEPYCNANTHAE* FROGGATT AND *PSYLLA UNCATOIDES* FERRIS AND KLYVER (HEMIPTERA: PSYLLOIDEA)

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## Abstract

The immature stages of *Psylla acaciaepycnanthae* Froggatt and *Psylla uncatoides* Ferris and Klyver are described and illustrated.

## Introduction

*Psylla acaciaepycnanthae* Froggatt and *Psylla uncatoides* Ferris and Klyver are two of the several species of psyllids that are found on *Acacia pycnantha* Bentham (Mimosaceae). *P. acaciaepycnanthae* is specific to *A. pycnantha* while *P. uncatoides* also utilizes other species of *Acacia* and *Albizia.* The adults of both species have previously been described (Ferris and Klyver 1932; Froggatt 1901) and *P. acaciaepycnanthae* redescribed (Yen 1977).

The immature stages of both species have not been previously described or illustrated.

## Materials and methods

The descriptions are based on material collected from *A. pycnantha* on the grounds of La Trobe University and reared in the laboratory. All material examined is slide-mounted, and measurements are given as mm + S.E. (number of measurements). Measurements of eggs are length and width, and those of nymphs are body length and width of head including the eyes.

Representative material will be deposited at the Museum of Victoria.

## Results

### *Egg development*

The eggs of both psyllid species are attached to the host plant tissue by the pedicel, and eggs on host tissue deprived of water shrivelled within two days. Eggs of both species are pale yellow when laid and darken to a deep golden yellow prior to eclosion. The exochorion is heavily pitted when viewed under high magnification. A red mycetome appears at the basal end of the egg, and two days before eclosion a pair of red eyes become visible through the exochorion. The head is at the distal end of the egg and the abdomen at the basal end.

### *Nymphs*

The nymphs of both species are naked in that they are not enclosed in a gall, under a lerp, or covered by woolly, waxy or flocculent material.

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Nymphs produce honeydew, and psyllid aggregations are sometimes covered by sooty mould.

In the following descriptions, the first instar is fully described and only differences are outlined for later instars.

### *Psylla acaciaepycnanthae* Froggatt

*P. acaciaepycnanthae* Froggatt, 1901: 243-245, pl. xiv, fig. 5.

*Egg*

Oval, slightly pointed distally and blunt basally. Length 0.30 + 0.003 (16); width 0.13 + 0.003 (16). Eggs are usually laid singly, but are sometimes arranged in a semi-circular pattern.

*Instar I* (Fig. 1)

Yellow, sclerites of head, thorax and abdomen light grey-brown. Body flat. Length 0.37 + 0.007 (20), width 0.17 + 0.005 (20). Head and abdomen of equal width with thoracic region narrower. Head tapered anteriorly. Eyes not projecting beyond contour of head. Antennae two-segmented with two rhinaria on segment 2. Head not clearly differentiated from thorax. Wing pads not developed. Legs two-jointed with one or two setae. Tarsi not differentiated. Abdomen with 14 marginal setae and with six setae around anal region.

*Instar II* (Fig. 2)

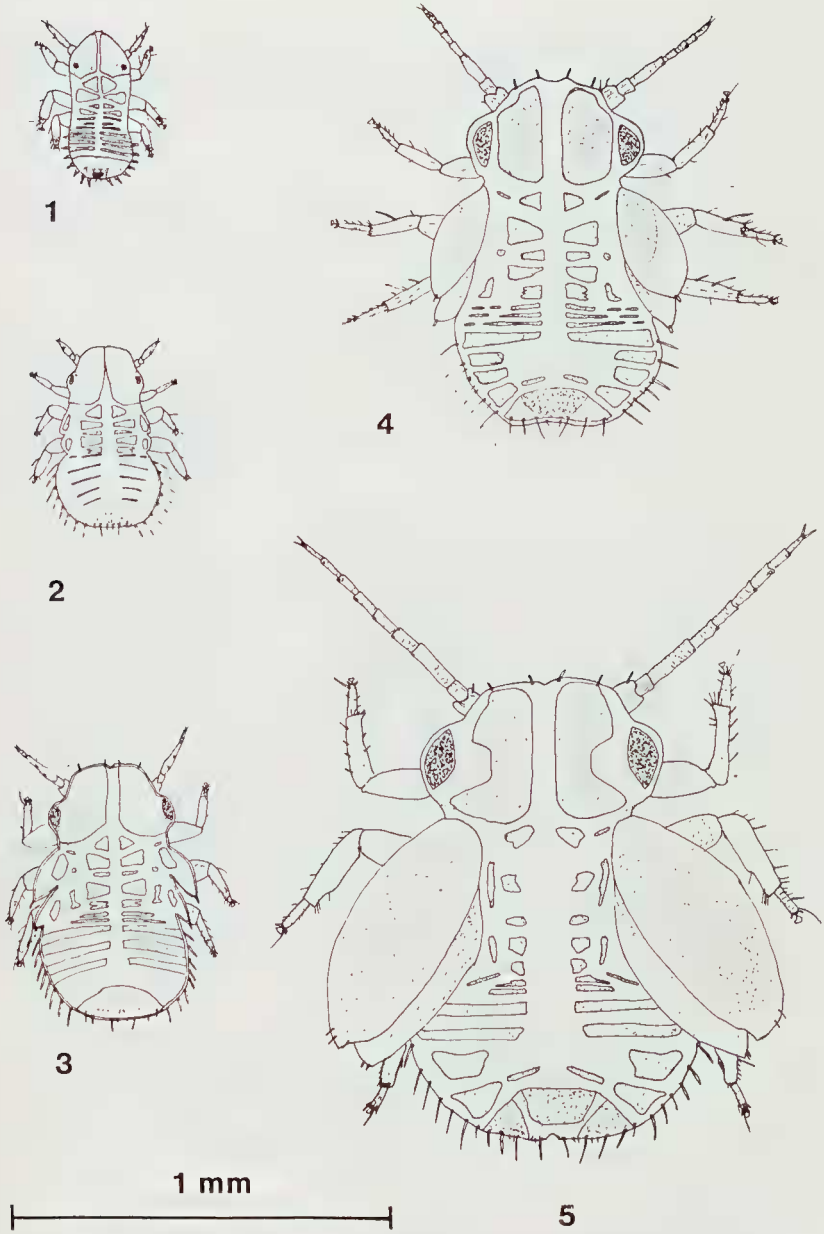
Abdomen wider than head. Length 0.49 + .011 (20), width 0.24 + .005 (20). Head tapering anteriorly to truncate apex. Eyes project beyond contour of head. Head clearly differentiated from thorax. Antennae three-segmented. Fore and hind wing pads small, rectangular and non-overlapping. Wing pads projecting slightly beyond contour of body. Abdomen rounded posteriorly to truncate apex. Abdomen with 16 marginal setae.

*Instar III* (Fig. 3)

Sclerites dark brown. Apical two antennal segments brown. Traces of red on body. Body flat anteriorly and enlarged posteriorly. Length 0.68 + 0.016 (20), width 0.33 + 0.003 (20). Head with four marginal setae. Antennae five-segmented with rhinaria on segments 3, 4 and 5. Wing pads rectangular and pointed at apex. Legs with 3-6 setae and five metatibial spines. Abdomen with 16 marginal setae and 6-10 setae around anal region.

*Instar IV* (Fig. 4)

Sclerites very dark brown. Apical three antennal segments brown. Median indentation on anterior of head and posterior of abdomen. Length 0.95 + 0.018 (20), width 0.47 + 0.007 (20). Antennae seven-segmented with rhinaria on segments 3, 5, 6, 7 and basal seta on segment 1. Forewing pads overlap hind wing pads. Each pad with one marginal apical seta. Legs three-jointed, tarsi unsegmented, and 5-7 setae. Abdomen with 12-16 marginal setae and 8-12 setae around anal region.




Figs 1-5. *Psylla acaciaepycnanthae*: (1) instar I; (2) instar II; (3) instar III; (4) instar IV; (5) instar V.

*Instar V* (Fig. 5)

Apical four antennal segments brown. Length 1.38 + 0.032 (20), width 0.63 + 0.007 (20). Antennae nine-segmented with rhinaria on segments 3, 4, 6, 7, 8, 9. Wing pads each with two marginal setae. Legs each with six setae. Abdomen with 16 setae around anal region.

*Notes*

*P. acaciaepycnanthae* prefers the underside of older phyllodes of *A. pycnantha.* It has overlapping generations, and all stages can be found together.

### *Psylla uncatoides* Ferris and Klyver

*P. uncatoides* Ferris and Klyver, 1932: pp. 53-54, pl. 13, Fig. D.

*Egg*

Oval, slightly pointed distally and blunt basally. Length 0.29 + 0.005 (19); width 0.13 + 0.005 (19). Eggs are usually laid singly, although sometimes they are deposited in a mass.

*Instar I* (Fig. 6)

Yellow with light grey-brown sclerites on head. Apical antennal segment brown. Body flat. Length 0.30 + 0.007 (30), width 0.17 + 0.006 (30). Head slightly wider than abdomen. No setae on dorsal side of body. Head rounded anteriorly and slightly differentiated from thorax. Eyes project slightly beyond contour of head. Antennae two-segmented with two rhinaria on segment 2. Wing pads not developed. Legs with two joints, tarsi undifferentiated, and with two setae. Abdomen with rounded posterior margin, 14 marginal setae and six setae around anal region.

*Instar II* (Fig. 7)

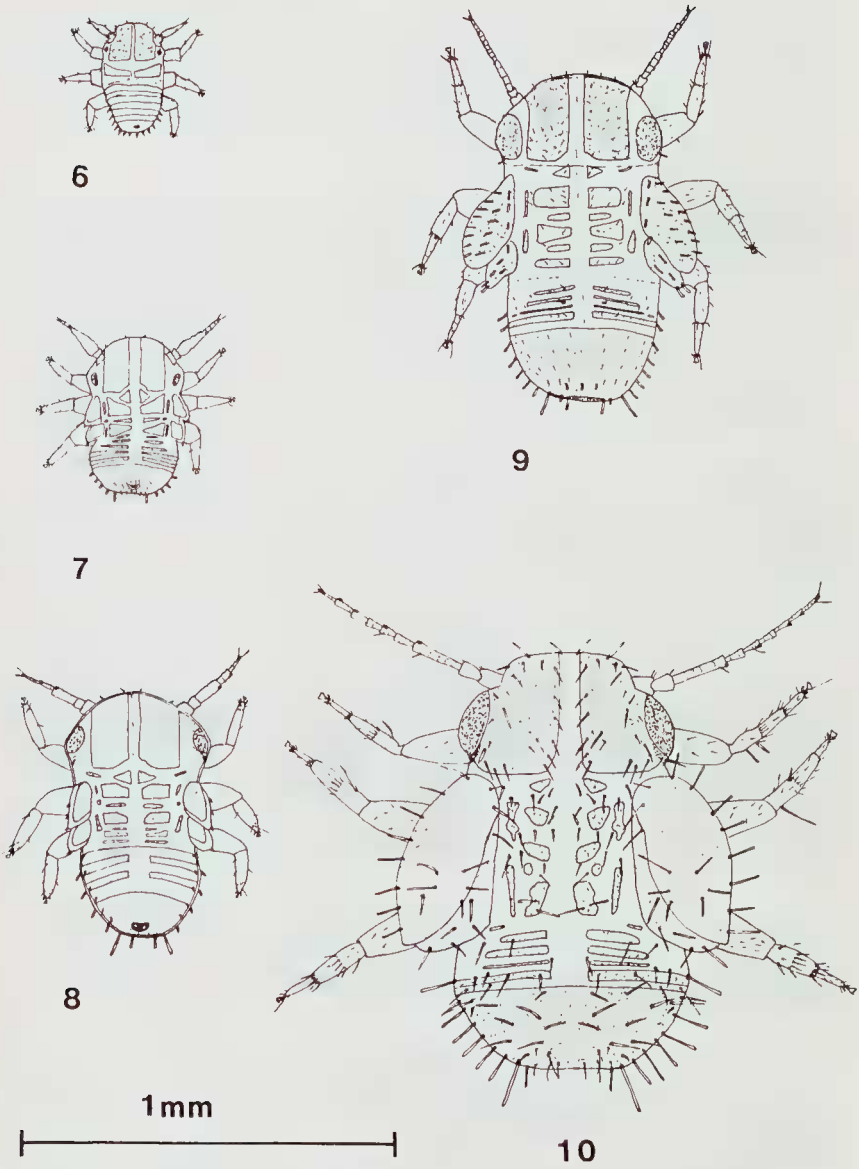
Sclerites on thorax and abdomen light grey-brown. Length 0.42 + 0.007 (20), width 0.24 + 0.007 (20). Head clearly differentiated from thorax. Antennae three-segmented with rhinaria on segment 3. Wing pads separate with fore and hindwing pads projecting beyond contour of body. Forewing pad triangular and hindwing pad rectangular, each with one apical marginal seta. Abdomen rounded to truncate posterior margin.

*Instar III* (Fig. 8)

Sclerites and apical one and a half antennal segments brown. Body enlarged posteriorly. Length 0.66 + 0.007 (20), width 0.35 + 0.007 (20). Antennae five-segmented with rhinaria on segments 3, 4, 5. Wing pads triangular and projecting beyond contour of body. Forewing pad with three marginal setae and hindwing pad with one marginal seta.

*Instar IV* (Fig. 9)

Sclerites dark brown. Apical three and basal two antennal segments brown. Length 0.83 + 0.021 (20), width 0.44 + 0.009 (20). Numerous short setae scattered on sclerites of head, thorax, abdomen and wing pads. Head




Figs 6-10. *Psylla uncatoides*: (6) instar I; (7) instar II; (8) instar III; (9) instar IV; (10) instar V.

rounded to truncate anterior margin, with six marginal setae. Antennae seven-segmented with rhinaria on segments 3, 5, 6, 7. Wing pads projecting beyond contour of body. Forewing pads overlap hindwing pads. Each forewing pad with 16 setae and each hindwing pad with six. Legs with three joints, tarsi unsegmented, and 4-6 apical tibial setae. Abdomen with 16 marginal setae and six setae around anal region.

*Instar V* (Fig. 10)

Apical four and a half and basal two antennal segments brown. Abdomen wider than head. Larger setae on sclerites on head, thorax, abdomen and wing pads, and some in the non-scleritized areas of thorax and abdomen. Length 1.40 + 0.037 (20), width 0.61 + 0.009 (20). Head with six marginal setae. Antennae nine-segmented with rhinaria on segments 3, 5, 7, 8, 9 and setae on segments 1, 2, 3. Legs with two groups of five setae, one located apically and the other medially on tibia. Abdomen with 16 marginal setae and 6-8 setae around anal region.

*Notes*

*P. uncatoides* prefers the young growing tips and the stems of *A. pycnantha* although young phyllodes are also used when the population density is high. It has overlapping generations, and all stages can be found together. *P. uncatoides* is most abundant in spring.

## Discussion

Variability in body length and head width for immature psyllids can be large. Solomon (1936) found that body length, head width and wing pad length of *Glycaspis occidentalis* Solomon nymphs gradually increased in size during each instar. Size differences in *Acizzia russellae* Webb and Moran can be attributed to density, temperature and host plant factors (Webb and Moran 1974). Each instar of *P. acaciaepycnanthae* and *P. uncatoides* can be determined by head width, but is best confirmed by the number of antennal segments.

## Acknowledgements

I wish to thank Dr T. R. New for his assistance and Mrs Heather Martin for typing the manuscript. The support of an Australian Government Post-graduate Award is acknowledged.

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